



## TEMCo Copper Magnet Wire - Data Sheet **GP/MR-200® - 200°C temp class** **Polyester/Polyamideimide**

<b>Gauge:</b>	10 to 31 AWG
<b>Conductor:</b>	Solid Round Copper
<b>Pounds per 1000 feet:</b>	ranges from 20.02 to 0.3192
<b>Feet per pound:</b>	ranges from 49.95 to 3132
<b>Insulation Temp. Rating:</b>	200°C
<b>Enamel Type:</b>	Polyester/Polyamideimide
<b>Enamel Build:</b>	Heavy build
<b>Average Wire Diameter:</b>	ranges from 0.0842 to 0.0116
<b>Manufacturer:</b>	Essex USA
<b>Product Line:</b>	GP/MR-200
<b>Color:</b>	Natural
<b>Solder Process:</b>	Remove enamel before soldering.
<b>Approvals:</b>	NEMA Designation (MW 35-C/A), IEC Designation (60317-13, 60317-25, 60317-29) UL Recognized
<b>Applications:</b>	Fractional and integral horsepower motors (hermetic and open), automotive and power tool motors, general purpose motors, dry-type transformers, large coil applications (unvarnished, varnished, or encapsulated), electronic coils.

**Product Description** GP/MR-200® is a multi-purpose film insulation which has a modified polyester basecoat and a polyamideimide topcoat. This combination provides a film insulation which has physical toughness, excellent dielectric properties, and superior chemical resistance to common solvents and refrigerants. Thermal properties of over 200°C qualify it for severe thermal overload applications. Compared to nylon overcoated polyester, it is superior in regards to physical moisture, chemical, and thermal resistance. GP/MR-200® is an extremely moisture-resistant film insulation coating, suitable for many uses including: open motor, high moisture applications, and hermetic applications. Other outstanding properties include thermal life, thermoplastic flow, burnout, and head shock.

This product is the standard of excellence for motor repair, maximum result, and minimum reject applications. It is impressive because it couples the extra advantages of high moisture resistance with ease of insertion.

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<b>Corporate Headquarters:</b>	TEMCo - Tower Electric Motor Company	41484 Christy Street	Fremont, CA 94538
<b>Inside USA:</b> (877) 474-8209	<b>International:</b> (510) 490-2187	<b>Fax:</b> (510) 490-1507	www.temcoindustrialpower.com

Specifications may vary slightly from the information provided. For certified drawings and specifications, please contact a TEMCo representative.



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## GP/MR-200<sup>®</sup> - 200°C temp class Polyester/Polyamideimide

### THERMAL PROPERTIES

	Typical Performance	Required Performance
HEAT SHOCK RESISTANCE	20%, 1xD, no cracks	20%, 3xD, no cracks
THERMAL STABILITY	213°C	200°C, minimum
THERMOPLASTIC FLOW	395°C	300°C

### PHYSICAL PROPERTIES

#### ABRASION RESISTANCE

Repeated Scrape (No. of strokes of 16" needle, 700 g. load)	150 avg. strokes	No requirement established.
Unidirectional	1550 g., avg	980 g., minimum; 1150 g., minimum avg.

#### ADHESION AND FLEXIBILITY

COEFFICIENT OF FRICTION	20%, 1xD, no cracks	20%, 3xD, no cracks
CONDUCTOR ELONGATION	Dry Lube: 0.02-0.06	No requirement established.
SPRINGBACK	38%	32%, minimum
	54°	58°, maximum

### ELECTRICAL PROPERTIES

CONTINUITY	less than 1 fault/100ft.	5 faults/100ft.
DIELECTRIC BREAKDOWN VOLTAGE		
Room Temperature	12,200 volts, avg.	5,700 volts, minimum
Rated Temperature	10,300 volts, avg.	4,275 volts, minimum

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### ENGINEERING HIGHLIGHTS

#### 1. THERMAL CLASSIFICATION

GP/MR-200® magnet wire is classified as 200°C on copper conductor and 220°C on aluminum.

#### 2. THERMOPLASTIC FLOW

GP/MR-200® magnet wire has excellent thermo-plastic flow (cut-thru) properties, with typical test values near 395°C.

#### 3. WINDABILITY

The windability of GP/MR-200® magnet wire, is excellent, and has been recently improved in the areas of lubricity and scrape resistance. This has been accomplished without sacrificing other key thermal and chemical properties.

#### 4. ELECTRICAL

GP/MR-200® magnet wire insulation exhibits high dielectric strength retention under high moisture conditions. Hydrolysis resistance is excellent.

#### 5. CHEMICAL

As shown by property data presented elsewhere in this brochure, resistance of GP/MR-200® magnet wire to both traditional refrigerants and replacement refrigerants (for CFC's and HCFC's) is excellent. GP/MR-200® magnet wire has been the standard for hermetic applications virtually since its inception.

#### 6. TERMINATION

Insulation piercing, hot staking and flame welding processes can all be used with

GP/MR-200® magnet wire. If the connection is to be soldered, the insulation must be removed prior to soldering. It is recommended that

### APPLICATION

GP/MR-200® magnet wire is the standard of comparison for magnet wire performance in virtually every severe and heavy duty application. The combination of a modified polyester basecoat and an improved polyamideimide topcoat results in an insulation system with outstanding physical toughness, excellent dielectric properties, and superior chemical resistance to most common solvents and refrigerants. Windability of GP/MR-200® magnet wire, verified by years of experience on virtually every type of winder, has always been excellent. Improvements in the topcoat have resulted in a product that is even more superior with regard to high slot fill and insertability.

#### **GP/MR-200® magnet wire is recommended for various end uses:**

##### • *Rotating Machines*

Fractional and Integral HP Motors

Hermetic Motors

DC Motors

Power Tools

Automotive Alternators and Generators

##### • *Transformers*

All dry type, Class 105 through 200

Control Type

##### • *Electronics*

All types of coils, Class 105 through 200

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### CHEMICAL PROPERTIES

### Typical Performance

### Required Performance

#### REFRIGERANT RESISTANCE

<b>Extraction</b>	0.02%	0.25%
<b>Blistering</b>	Passes	No flaking
<b>Softening</b>	Passes	575 g., scrape, minimum
<b>Dielectric Breakdown after R-22</b>	9,200 volts	5,700 volts, minimum
<b>Crazing</b>	Passes	No crazing at 10x magnification.
<b>Compatibility (R-134a)</b>	Passes	No deterioration.
<b>Compatibility (R-123)</b>	Passes	No deterioration.

#### SOLUBILITY

<b>Other solvents</b>	Passes	575 g., scrape, minimum
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Petroleum naphtha, 3° toluene,  
ethanol, 5% sulfuric acid, 1%  
potassium hydroxide, butyl acetate  
acetone for 24 hours at room  
temperature.

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### Recommended Winding Tension

Whole AWG Size	NEMA NOM. BARE O.D. Inches	Maximum Tension Grams
30	0.01000	358
31	0.00890	282
32	0.00800	228
33	0.00710	180
34	0.00630	142
35	0.00560	112
36	0.00500	89
37	0.00450	72
38	0.00400	57
39	0.00350	44
40	0.00310	34
41	0.00280	28
42	0.00250	22
43	0.00220	17
44	0.00200	14
45*	0.00176	11
46*	0.00157	8.8
47*	0.00140	7
48*	0.00124	5.5
49*	0.00111	4.4
50*	0.00099	3.5
51*	0.00088	2.8
52*	0.00078	2.2
53*	0.00070	1.7
54*	0.00620	1.4

**Note:** This table is provided as a general guide only. The appropriate winding tensions may vary depending on a number of factors, including product application. The type of winder, payoff device, and type of coil may vary the tensions to be used. In general, use the minimum tension that provides a good winding. Some minor variations in the softness of the wire from one lot to another may also dictate minor adjustments in winding tension.

Using the yield strength of fully annealed wire as a point of reference, tensions beyond these may cause excessive stretching and high coil resistance.

Maximum recommended tensions are based upon 10,000 p.s.i. for copper.

\* Theoretical dimensions for sizes 45 AWG and finer.